

[057] All patents referred to or cited herein are incorporated by reference in their entirety to the extent they are not inconsistent with the explicit teachings of this specification, including; U.S. Patent No. 5,108,438 (Stone), U.S. Patent No. 5,258,043 (Stone), U.S. Patent No. 4,904,260 (Ray et al.), U.S. Patent No. 5,964,807 (Gan et al.), U.S. Patent No. 5,849,331 (Ducheyne et al.), U.S. Patent No. 5,122,154 (Rhodes), U.S. Patent No. 5,204,106 (Schepers et al.), U.S. Patent No. 5,888,220 (Felt et al.) and U.S. Patent No. 5,376,120 (Sarver et al.).

[058] It should be understood that the examples and embodiments described herein are for illustrative purposes only and that various modifications or changes in light thereof will be suggested to persons skilled in the art and are to be included within the spirit and preview of this application and the scope of the appended claims.

#### Claims

1. An annulus stent, for repair of an intervertebral disc annulus, comprising an elongated centralized vertical extension, said centralized vertical extension comprising a left and a right lateral extension along said centralized vertical extension's horizontal axis.
2. The annulus stent according to claim 1, wherein said vertical extension further comprises a slot.
3. The annulus stent according to claim 1, wherein said vertical extension is perforated.

4. The annulus stent according to claim 1, wherein said left and right lateral extensions comprise an inside edge, an outside edge, an upper surface and a lower surface, wherein said inside edge joins said centralized vertical extension to form a horizontal plane.

5. The annulus stent according to claim 4, wherein said upper surface forms an angle of about 0 to 60 degrees below said horizontal plane.

6. The annulus stent according to claim 4, wherein the length of said inside edge is less than the length of said outside edge.

7. The annulus stent according to claim 4, wherein said inside edge has a greater thickness than said outside edge.

8. The annulus stent according to claim 4, wherein said upper surface is barbed.

9. The annulus stent according to claim 4, further comprising a recess wherein said upper surface joins said centralized vertical extension.

10. The annulus stent according to claim 4, wherein said lateral extension further comprises a compressible core affixed to said lower surface.

11. The annulus stent according to claim 10, wherein said compressible core is made of a compressible biocompatible material.

12. The annulus stent according to claim 10, wherein said compressible core is made of a compressible bioreabsorbable material.

13. The annulus stent according to claim 4, further comprising a flexible bladder affixed to said lower surface of said left and right lateral extensions.

14. The annulus stent according to claim 13, wherein said flexible bladder comprises a membrane enclosing an internal cavity.

15. The annulus stent according to claim 14, wherein said internal cavity is empty.

16. The annulus stent according to claim 14, wherein said membrane comprises a thin flexible biocompatible material.

17. The annulus stent according to claim 16, wherein said membrane further comprises a semi-permeable material.

18. The annulus stent according to claim 17, wherein said internal cavity contains a biocompatible fluid.

19. The annulus stent according to claim 18, wherein said biocompatible fluid is a hydrogel.

20. The annulus stent according to claim 16, wherein said membrane further comprises an impermeable material.

21. The annulus stent according to claim 20, wherein said internal cavity contains a biocompatible fluid.

22. The annulus stent according to claim 1, wherein said centralized vertical extension is of a shape selected from the group consisting of a trapezoid, circular and curved.

23. The annulus stent according to claim 1, wherein said annulus stent is made from a material selected from the group consisting of a biocompatible material, a bioactive material, and a bioreabsorbable material.

24. The annulus stent according to claim 23, wherein said annulus stent is made from a biocompatible fiber mesh.

25. The annulus stent according to claim 23, wherein said annulus stent is made from a bioreabsorbable fiber mesh.

26. The annulus stent according to claim 23, wherein said annulus stent is made from expandable polytetra fluoroethylyene.
27. The annulus stent according to claim 1, wherein said annulus stent comprises a material to facilitate regeneration of disc tissue.
28. The annulus stent according to claim 1, wherein said annulus stent comprises a hygroscopic material.
29. An annulus patch, wherein said annulus patch is of the size and shape for repair of a intervertebral disc annulus.
30. The annulus patch according to claim 29, wherein said annulus patch is human muscle fascia, an autograft, an allograft or a xenograft.
31. A method for repairing an intervertebral disc, wherein said intervertebral disc comprises a disc nucleus and a disc annulus, comprising the steps of;
- a) forming an aperture in said intervertebral disc annulus; and
  - b) securing across said aperture to said intervertebral disc annulus an annulus patch.

32. The method for repairing an intervertebral disc according to claim 31, wherein said annulus patch is human muscle fascia, an autograft, an allograft, or a xenograft.

33. The method for repairing an intervertebral disc according to claim 31, further comprising the step of preparing said intervertebral disc, wherein said preparation step comprises the steps;

- a) identifying a damaged section of said disc nucleus; and
- b) removing said damaged section of said disc nucleus.

34. A method for repairing an intervertebral disc, wherein said intervertebral disc comprises a disc nucleus and a disc annulus, comprising the steps of;

- a) forming an aperture in said intervertebral disc annulus;
- b) inserting an annulus stent into said aperture, wherein said annulus stent comprises an elongated centralized vertical extension, a left and a right lateral extension along said centralized vertical extension's horizontal axis; and
- c) securing said annulus stent to said intervertebral disc annulus.

35. The method for repairing an intervertebral disc according to claim 34, wherein said step of forming said aperture in said disc annulus comprises the step of making a surgical incision into said disc annulus.

36. The method for repairing an intervertebral disc according to claim 34, wherein said step of inserting said annulus stent into said aperture comprises the steps of;

- a) compressing said left and right lateral extensions together;
- b) inserting said annulus stent into said aperture, such that an upper surface of said left and right lateral extensions conforms to an inside surface of said disc annulus; and
- c) positioning said centralized vertical extension within said aperture, such that said annulus stent may be secured to said disc annulus.

37. The method for repairing an intervertebral disc according to claim 34, wherein said step of inserting said annulus stent into said aperture comprises the steps of;

- a) compressing said left and right lateral extension together;
- b) rotating said annulus stent, such that said annulus stent may be laterally inserted into said intervertebral disc;
- c) inserting said annulus stent laterally through said aperture into said intervertebral disc;

d) rotating said annulus stent within said intervertebral disc, such that an upper surface of said left and right lateral extensions conforms to an inside surface of said disc annulus; and

e) positioning said centralized vertical extension within said aperture, such that said annulus stent may be secured to said disc annulus.

38. The method for repairing an intervertebral disc according to claim 34, further comprising a step of preparing said intervertebral disc, wherein said preparation step comprises the steps of inserting a set surgical screws into a pair of adjacent intervertebral, wherein said surgical screws comprise an eye hole located at the top of said surgical screw.

39. The method for repairing an intervertebral disc according to claim 38, wherein said step of securing said annulus stent to said intervertebral disc comprises the steps of threading a surgical suture through said eye hole on said surgical screw.

40. The method for repairing an intervertebral disc according to claim 34, further comprising the step of preparing said intervertebral disc, wherein said preparation step comprises the steps;

- a) identifying a damaged section of said disc nucleus; and
- b) removing said damaged section of said disc nucleus.



41. The method for repairing an intervertebral disc according to claim 40, wherein said step of inserting said annulus stent into said aperture comprises the steps of;

- a) compressing said left and right lateral extensions together;
- b) inserting said annulus stent into said aperture, such that an upper surface of said left and right lateral extensions conforms to an inside surface of said disc annulus;
- c) positioning said centralized vertical extension within said aperture, such that said annulus stent may be secured to disc annulus; and
- d) injecting a biocompatible fluid into said internal cavity, through said annulus stent.

42. The method for repairing an intervertebral disc according to claim 41, wherein said biocompatible fluid comprises a hygroscopic material.

43. The method for repairing an intervertebral disc according to claim 40, wherein said step inserting said annulus stent into said aperture comprises the steps of;

- a) compressing said left and right lateral extensions together;
- b) rotating said annulus stent, such that said annulus stent may be laterally inserted into said intervertebral disc;
- c) inserting said annulus stent laterally through said aperture into said intervertebral disc;

d) rotating said annulus stent within said intervertebral disc, such that an upper surface of said left and right lateral extensions conforms to an inside surface of said disc annulus;

e) positioning said centralized vertical extension within said aperture, such that said annulus stent may be secured to disc annulus; and

f) inject a biocompatible fluid into said internal cavity, through said annulus stent.

44. The method for repairing an intervertebral disc according to claim 43, wherein said biocompatible fluid comprises a hygroscopic material.